A COMMUNITY PERSPECTIVE ON THE JACOBS WELL SAND MINE LAKE.

Prepared by Environmental Sub-Committee for

JACOBS WELL PROGRESS COMMITTEE

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WHAT IS THE JACOBS WELL PROGRESS COMMITTEES PROBLEM REGARDING THE LOCAL SAND MINE?

There are several problems facing the Jacobs Well Progress Committee in relation to the local sand mine site as follow:

- The primary problem is that the Progress Committee does not have enough information regarding the current acidity levels or chemistry of the lake which will determine, to a large extent, the rehabilitation problem and future use of the site. Pit lakes can also become a health and safety problem, as well as an environmental problem, with the potential for water borne diseases. One example is the extent of the stagnant water at the conclusion of the mine's life which will provide an extensive breeding ground for mosquito populations. Another is the potential for the lake to cause serious acidity and pollution of the ground water.
- Secondly, the Progress Committee does not know what conditions of closure were required when the mining licence was issued. Mining site rehabilitation is not a problem that should be considered at the end of the mines life but should be part of an integrated program of planning and management throughout the life of the mine. Current mining approval legislation under the Mines and Minerals Act 1989, the Mining and Other Legislation Amendment Bill 2012, the Environmental Protection Act 1994 require, among other things, security against issue of title that ensures site maintenance and final site rehabilitation.
- Thirdly, the timeline for rehabilitation proposed by the mining company is too long. It also does not identify any partnerships that need to be formed in the rehabilitation process, including with the community, and there is little scientific data on which the rehabilitation report is based.
- A fourth problem is that little or no consideration is given in the rehabilitation plan to local consultation and involvement in the planning and future development process.
- Finally, the Progress Committee has little understanding of the role and responsibility of the State Government and Gold Coast Council with regard to this site and the required rehabilitation outcomes, in addition to the responsibilities of environmental and mining authorities.

WHAT CAN JACOBS WELL PROGRESS COMMITTEE EXPECT AS A REHABILITATION OUTCOME (THE PENRITH LAKES AN EXAMPLE OF SAND MINE REHBILITATION).

Penrith lakes is an example of sand mine rehabilitation that can be expected to occur at Jacobs Well. In rehabilitating the acid lakes the Penrith Lakes Development Council was formed comprising mining companies, NSW Government; the Penrith Council university departments, CSIRO and the community. These key partnerships were all important to the rehabilitation projects. Rehabilitation made improved water quality a major priority which necessitated the identification of a pH level of 5.9 or lower for recreational use. In addition there was chemical treatment of water; installation of water aerators to move water from the bottom of the lake thus preventing nutrient development, and then; colonisation of the lake with aquatic plants. This multi-faceted approach is considered necessary in changing and maintaining pH levels.

The Penrith Lakes development is more than just a mining restoration project. Development is ongoing and includes consultation with a Community Advisory Committee. The site comprises walking trails, wetlands, parklands, water recreation and regatta centres, and engineering infrastructure to maintain water quality. (www.penrithlakes.com.au).

WHAT ARE THE SCIENTIFIC ASPECTS OF AN ACID LAKE PROBLEM?

The content of the lake sediment (sulphates) and lack of oxygen produce the conditions in which anaerobic bacteria develop and add to the acidity in the lake through the production of sulphides. The higher the pH levels of water the lower the acidity level. Acidity levels of 5.6 pH or lower are considered toxic to fish. The pH levels can change with the depth of the lake.

Two types of acid neutralisation of the lake are possible: namely chemical neutralisation and microbiological alkalinity production. The first process involves treatment with chemicals such as soda ash and lime. This however is not sustainable or sufficient as a long term change and other things need to be done. This brings us to microbiological alkalinity production which acts to reverse of the acidification processes i.e. leads to the reduction of Fe(III) and sulphate. These processes are carried out by other bacteria in anoxic conditions such as are found in healthy lake sediments. To enhance these microbial processes, the bacteria need an increased supply of organic carbon as substrate. This requires addition of organic materials such as agricultural wastes (saprobization) or organics produced within the water of the lake through enhanced primary production achieved through fertilization (eutrophication). In the long term it is desirable to increase sustainable primary production of organic materials in the substrate or sediment of the lake. Lack of oxygen at the bottom of the lake creates an environment which is favourable to the production of anaerobic bacteria. Aeration of the water, as occurred in the Penrith Lakes is therefore helpful to both the chemical and microbiological production.

WHERE TO FROM HERE FOR THE JACOBS WELL PROGRESS COMMITTEE?

For any desirable community outcome to occur it is necessary to have a plan that addresses the constituents of the problem. The following preliminary suggestions are made as the basis of such a plan.

- Agree that the Progress Committee which represents (among other) the Jacobs Well community has an important role to play in ensuring the best possible community and health outcomes for Jacobs Well.
- Clarify the roles of Council, the Queensland Government, environmental authorities and local universities in ensuring the best possible outcomes.
- Canvass the support and involvement of appropriate professional and environmental authorities in understanding the problem clearly and in the development of solutions.
- Follow the model and learn from the Penrith Lakes Development Council which included community representation.
- Obtain under freedom of information all relevant documentation regarding rehabilitation of the mine site.
- Develop and follow clear and realistic objectives for rehabilitation of the site.
- Consolidate the Environmental Sub-Committee's legitimacy in taking the problem forward..